Comments to FCC WT Docket No. 24-240 RM-11989

My name is Greg Noneman. I hold an Amateur Extra Class license, WB6ZSU and I am also the trustee for the amateur club, N6EX (Southern California Experimental Amateur Radio Association). I have been a licensed amateur since 1967 and for the better part of the past 20 years have been dedicated to the advancement of amateur operations on the 900 MHz band. The N6EX group currently has five 900 MHZ NBFM/P25 repeaters in operation in the Southern California area and is continually pursuing opportunities for expansion of the N6EX 900 MHz repeater system. In addition to my amateur experience, I have been a practicing electrical engineer since 1977.

SUMMARY

These comments are in response to the NextNav petition for reconfiguration of the 902 – 928 MHz band ("Lower 900 MHz Band"). I have reviewed the NextNav petition for rulemaking and the FCC public notice related to this petition. While I understand the importance of position, navigation and timing capability and the need for a high-fidelity adjunct/backup to space-based solutions, my comments stated herein are in support of the FCC **rejection of the NextNav solution**. My position is based on the following considerations:

- The NextNav position that "Updating the Lower 900 MHz Band M-LMS framework will not impede amateur operations" is not an accurate statement. Part 97 amateur operation on the allocated 900 MHz segment has increased significantly over the past 10 to 20 years, most dramatically in the NBFM and P25 modes. This increase is due in part to the availability of new/surplus Part 90 subscriber and infrastructure equipment. Limitations of this hardware constrains amateur operation of repeater applications to the 902-903 MHz and 927-928 MHz subsegments of the band. Removing these two 1 MHz subsegments would extremely curtail, if not eliminate, NBFM and P25 900 MHz amateur operations.

- The feasibility of making the proposed TPNT system adequately meet requirements given the large number of unlicensed users, especially in high population centers. This would seem to be a high concern for public safety operation (e.g. E911). The ability of move these users would be monumental given there is no finite group or manufacturer that could be contacted to eliminate this source of "interference".

COMMENT DETAIL

General Comments

NextNav is proposing a TPNT approach that is based on restructuring the 902 to 928 MHz (Lower 900 MHz Band) to meet their needs. They state that this band segment is currently underutilized and inefficiently allocated. Yet, there seems to be no information in their petition to support these statements. In their Executive Summary, they imply that failure to employ their technology will result in continued underutilization of the 902 – 928 MHz spectrum and result in the United States inability to attain a TPNT that is accurate and widely available. These appear to be myopic and self-serving positions.

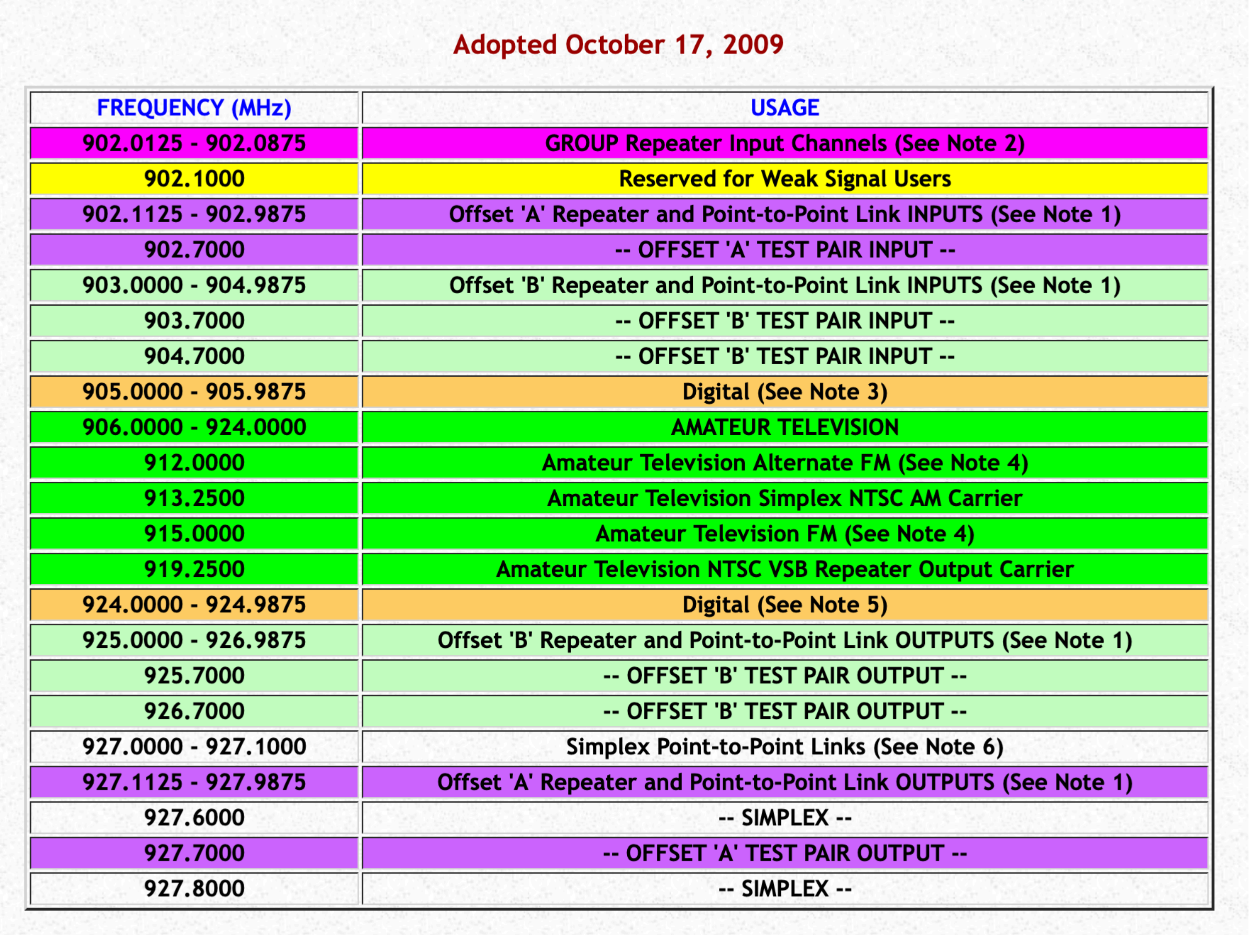
The NetNav TerraPoINT technology is one of several solutions that has been considered but appears to be the only one that utilizes the 902 – 928 MHz spectrum. They note that other countries have identified TPNT as a necessary component of their national PNT capabilities. What frequency bands are these other countries investigating? Are these countries proposing reallocation of spectrum that jeopardize or eliminate operation of other incumbent services?

The general point is that NextNav appears to have a point solution that mandates restructuring of the Lower 900 Band without due consideration of using other band segments, and without significant evaluation of the impact on incumbent users under the existing allocations.

Impact to Amateur Operations

As a licensed amateur radio operator that uses the 902 – 928 MHz band segment daily, I have familiarity with utilization of this band segment by the amateur community. NextNav in their petition on multiple occasions states that their restructuring of the 900 band “will not impede amateur operations” and that they will work with incumbents (including amateurs) to accommodate this restructuring. They reference the fact that the American Radio Relay League (ARRL) failed to file comments in 2013 regarding NextNav’s implementation having an impact on amateur operation. This does not have any bearing on what the impact would be in 2024 and beyond. The ARRL, although being a major voice in the amateur community, did not have an accurate view of where the amateur 900 community was back in 2013. They had an outdated band plan that did not represent how amateurs across the country were actually using the 902 – 928 MHz band.

In the early 2000’s, large quantities of used 900 MHz commercial radios (Part 90) flooded the market. The ingenuity of the amateur community allowed these radios to be used within the 902 – 928 MHz amateur allocated band. Amateur repeaters (initially NBFM) began popping-up across the country. Because of limitation of these radios (and other commercial infrastructure hardware), repeater operations were generally limited to inputs (at repeater) in the 902 – 903 subsegment and repeater outputs in the 927 - 928 subsequent (a 25 Hz transmitreceive offset). Local frequency management groups began developing their own band plans that matched the capabilities of the commercial equipment in the extremes of the band segment and placed other amateur activities in between these band edge segments. Below is an example of such a band plan. It was adopted by the Southern California Repeater and Remote Base Association in 2009 and is still in effect as of the writing of the document.



Southern California 33cm Band Plan (902 - 928MHz)

Adopted October 17, 2009

FREQUENCY (MHz)	USAGE
902.0125 - 902.0875	GROUP Repeater Input Channels (See Note 2)
902.1000	Reserved for Weak Signal Users
902.1125 - 902.9875	Offset 'A' Repeater and Point-to-Point Link INPUTS (See Note 1)
902.7000	-- OFFSET 'A' TEST PAIR INPUT --
903.0000 - 904.9875	Offset 'B' Repeater and Point-to-Point Link INPUTS (See Note 1)
903.7000	-- OFFSET 'B' TEST PAIR INPUT --
904.7000	-- OFFSET 'B' TEST PAIR INPUT --
905.0000 - 905.9875	Digital (See Note 3)
906.0000 - 924.0000	AMATEUR TELEVISION
912.0000	Amateur Television Alternate FM (See Note 4)
913.2500	Amateur Television Simplex NTSC AM Carrier
915.0000	Amateur Television FM (See Note 4)
919.2500	Amateur Television NTSC VSB Repeater Output Carrier
924.0000 - 924.9875	Digital (See Note 5)
925.0000 - 926.9875	Offset 'B' Repeater and Point-to-Point Link OUTPUTS (See Note 1)
925.7000	-- OFFSET 'B' TEST PAIR OUTPUT --
926.7000	-- OFFSET 'B' TEST PAIR OUTPUT --
927.0000 - 927.1000	Simplex Point-to-Point Links (See Note 6)
927.1125 - 927.9875	Offset 'A' Repeater and Point-to-Point Link OUTPUTS (See Note 1)
927.6000	-- SIMPLEX --
927.7000	-- OFFSET 'A' TEST PAIR OUTPUT --
927.8000	-- SIMPLEX --

(ref. https://www.scrrba.org/BandPlans/33cm.htm)

Similar band plans were adopted across the country, and over time, hundreds of amateur repeaters were put into operation. Note that these band plans do not match that which was offered as reference by the ARRL back in 2013 but do represent allocations which best utilize the 902 – 928 MHz band by the amateur community. My assumption is that, based on more current information, the ARRL will be presenting comments which oppose the NextNav petition for the 900 band restructuring.

Several sources can be found to substantiate the existence of the repeaters across the country. Perhaps one of the best web references can be found at repeaterbook.com. As of 02 September 2024, RepeaterBook lists 625 amateur repeaters in the 900 MHz band, with 446 confirmed as being on-the-air. The

ARRL Repeater Directory is published annually which also lists the hundreds of repeaters across the country.

Our radio club (N6EX) operates five 900 MHz NBFM/P25 mixed mode repeaters in the Southern California region, although we are always looking for opportunities to expand 900 MHz operations. Southern California alone has over thirty 900 MHz repeaters, with up-to-the-date listing on the following webpage:

https://www.physics.ucla.edu/~corbin/900MHz.html

While most of my personal experience is in the Southern California region, I am aware of several large groups of 900-cenrtric operations across the country:

Northeast US: https://near900.com

Texas: https://k5tra.net/TechFiles/900%20MHz%20FM%20-%20San%20Antonio%20-%20July%202018.pdf

Arizona: http://arizona900network.net/repeaters/

Northern California: https://kj6ko.com/page2.html

Many of these groups have invested large amounts of time and money in support of 900 MHz amateur operations. This includes personal radio hardware, repeater hardware and repeater site rentals. All of this investment is tied to the existing frequency allocations, which are at risk if the NextNav petition for restructuring is approved by the FCC. While most of the comments presented thus far pertain to repeater operations, there are other modes such as weak signal, amateur television that are also impacted by a restructuring. But it must be emphasized that the repeater operations, which comprise the largest amateur 900 MHz population are dependent on retaining the 902 – 903 and 927 – 928 subsegments due to the reliance on the available commercial equipment.

It is my understanding that NextNav has performed testing in the past several years in the Northern California and Dallas, Texas regions with disastrous impacts on amateur repeater operations. The high power, wide bandwidth NextNav transmissions made local amateur repeaters unusable. It was not until they were asked (and agreed) to move well outside the amateur repeater subsegments that operation resumed as normal. It is obvious from initial testing that the services must be adequately separated in frequency and that NextNav's current restructuring with 902 – 907 uplink and 918 – 928 downlink sub-segments is incompatible with current amateur repeater operations.

Coexistence with other Incumbents

As was stated earlier with the amateur incumbent, NextNav's petition only includes general statements that it will work with incumbents and that incumbent licensees will be protected. How can this be facilitated or guaranteed? Has any of this begun?

In the amateur case, no detailed communications were conducted prior to submitting the petition, because if so, the statement that the restructuring of the Lower 900 Band "will not impede amateur operations" could not have possibly been suggested.

The petition does not include any information regarding cooperation with existing Federal Radiolocation or Part 18 (ISM) services or how the cost of relocating these services will be accommodated.

In the case of the millions of unlicensed Part 15 devices, they state that they "will work with unlicensed users to understand their spectrum requirements". Given that these are unlicensed devices and users, who will they be working with? They also state that Part 15 devices must coexist with one another in addition to other operations in the band. They must be robust and adapt to ever-present interference. The implication is that they were robust enough to operate in the present environment, and therefore will operate under the proposed NextNav restructuring and new signal sources. If this isn't the case, how will this impact the public who currently has millions of these devices. How will these devices impact the NextNav solution?

In summary, there doesn't appear to be sufficient information supplied in the NextNav petition to assure overall success for their approach or to guarantee that existing services won't be significantly impacted by their proposed restructuring.

CONCLUSION

I strongly suggest that the FCC deny NextNav's petition for restructuring of the Lower 900 MHz Band based on previously detailed comments:

- The detrimental impact of the proposed restructuring on the amateur 900 MHz amateur service.
- Inadequate research performed to determine viability of coexistence of all incumbent services with NextNav solution under the proposed restructuring

Additionally, no information was given as to the position of the Public Safety community regarding incorporating NextNav's solution into their operations. NextNav's petition states that "This z-axis capability is also available to public safety through FirstNet (built with AT&T)”. Does this imply that the NextNav capability would be an adjunct to what is already available as part of FirstNet? Is it needed? Would the national Public Safety community be willing to utilize a single commercial approach for their E911 operations?

All of the above factors suggest that the NextNav Petition for Rulemaking should not be granted.

Thank you for considering my comments.

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